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Two new species of the genus *Suffasia* from Sri Lanka (Araneae: Zodariidae)

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Two new species of the genus *Suffasia* from Sri Lanka (Araneae: Zodariidae). - Two new species of the genus *Suffasia* Jocqué, 1991 are described. *S. mahasumana* sp. n. is known from both sexes and is related to *S. tunegaster* Jocqué, 1992. *S. attidiya* sp. n., known only from two female specimens, may be related to *S. tigrina* (Simon, 1893). *S. attidiya* sp. n. is found in diverse habitats, *S. mahasumana* sp. n. is confined to cloud forests in the central highlands of Sri Lanka. This is the first record of *Suffasia* from Sri Lanka, other species in this genus are known only from southern India and Nepal.

Key-words: Araneae - Zodariidae - *Suffasia* - tropical montane cloud forests - Sri Lanka.

INTRODUCTION

The genus *Suffasia* was established for two species from southern India. The type species, *S. tigrina* (Simon, 1893) from Kodaikanal, Tamil Nadu, and an undescribed species from the same locality (Jocqué, 1991). *S. tunegaster* Jocqué, 1992, from Kathmandu, Nepal, was added later. Considering the affinities of the faunas of India and Sri Lanka it was to be expected that members of *Suffasia* or at least of closely related genera might be discovered on the island.

During recent field work in Sri Lanka two undescribed species were collected. The first one is from the Knuckles Range, consisting of a number of remnant patches of primary tropical montane cloud forests, a type of vegetation that was once common in the central highlands of Sri Lanka. Most of these forests were cleared for tea plantations during the British colonial period. The second species was collected in fragmented marshland situated on the outskirts of Colombo. On both localities the specimens were obtained by beating shrubs and small trees which is an unusual way to collect zodariids as they are considered soil dwelling spiders except for the representatives of the Storenomorphinae (Jocqué, 1991). In the Bellanwila-Attidiya sanctuary a marshy area near Colombo, shrubs are scattered around shallow water ponds, marshes and sea-

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sonally flooded grassland. A female of the second new species was collected by the same method in Kalugala, Labugama Forest Reserve, a fragmented remnant of tropical lowland rain forest, some 40 km away from the former locality.

METHODS

Structures were examined in temporary mounts embedded in glycerine. Vulvae were cleared with trypsin (0.1% trypsin, 0.1% $CaCl_2$, in 0.05M tris-buffer, pH 7.6). All drawings were made with a Nikon Labophot-2 and a Nikon SMZ-U microscopes with drawing tube. Measurements are in mm. Structures examined with the scanning electron microscope (PHILIPS XL30 FEG ESEM) were critical point dried, stud-mounted and sputter coated for observation and photography. Specimens examined are deposited in the "Muséum d'histoire naturelle, Genève" (MHNG) and the "Naturhistorisches Museum, Basel" (NMB).

Abbreviations used in the text and figures: AER anterior eye row; ALE anterior lateral eyes; AME anterior median eyes; CD copulatory duct; CF cymbial flange; CO copulatory opening; E embolus; FD fertilisation duct; PER posterior eye row; PLE posterior lateral eyes; PME posterior median eyes; TA tegular aphophysis.

Suffasia mahasumana sp. n. Figs 1-7, 13-21

Holotype ♂: Sri Lanka, Central Province, Knuckles Range, Deenston (approximately 7° 19' N, 80° 51' E), 1100 m, 11 March 1998. Leg. Suresh P. Benjamin (MHNG).

Paratypes: 1♀, 11 March 1998 (MHNG); 1♂, 1♀ 12 March 1998 (NMB); further as holotype.

Etymology: Named after god Maha-Sumana, protector of the hill country in Sri Lanka. Noun in apposition.

Diagnosis: *S. mahasumana* is closely related to *S. tunegaster*; the male can be recognised by the absence of a dorsal spike on the palpal tibia, the shape of the dorsal cymbial flange which is flat and evenly rounded in the latter, swollen, curved upwards and concave in the former; the female differs from that of *S. tunegaster* by the presence of a roughly rectangular plate in the anterior part of the epigyne.

Description: Male (holotype). Colouration and markings: carapace dark yellow-brown, with dark reticulations on anterior part and with U-shaped dark marking in front of fovea (Fig. 14). Chelicerae and sternum dark yellow, lighter than carapace. Dorsum of opisthosoma uniform darkgrey, venter white, without markings. Legs light yellow with dark dorsal markings. AER almost straight, PER slightly procurved, all eyes circular, AME 1.5 times their diameter apart from each other and at about the same distance from ALE. PME 2 times their diameter apart and about the same distance from PLE. ALE = PLE = PME > AME. Clypeus height 6 times the diameter of ALE. Chilum present. Chelicerae not fused, with double-tooth on promargin. Labium triangular. Sternum sub triangular, with spike-like extensions projecting towards base of coxae. Leg formula 4132, 2 spines dorsally on femora I-IV. Tibiae with flattened incised hairs (Fig. 16, FIS); and ventral tuft of metatarsal preening brush with chisel-shaped hairs (Figs 16, 17, CH; see also Jocqué, 1991: figs 6, 8, 11, 12). Femoral organ (Fig. 20) present on each leg. Trichobothrium base with concentric ridges (Fig. 15).

Palp (Figs 1-4): Tibia with stout, sharp, strongly tapered retrolateral apophysis, pointing outwards. Cymbium strongly narrowed in dorsal view, with swollen, upwards curved, dorsolateral flange (Fig. 1, CF), extending lateral cymbial concavity, carrying some sensorial hairs in superior part; embolus fairly short, stout, originating on

Measurements: total length: 2.3; carapace length: 1.3; carapace width: 1.0. Legs:

	I	II	III	IV
femur	1.1	0.9	1.0	1.1
patella	0.2	0.2	0.3	0.3
tibia	1.0	0.7	0.7	1.0
metatarsus	1.1	0.9	1.0	1.5
tarsus	0.5	0.4	0.4	0.5
total	3.9	3.1	3.4	4.4

posterior part of tegulum separated from main part by shallow groove; tegular apophysis, short, stout, sharp, pointing out and forwards (Figs 1, 2, TA).

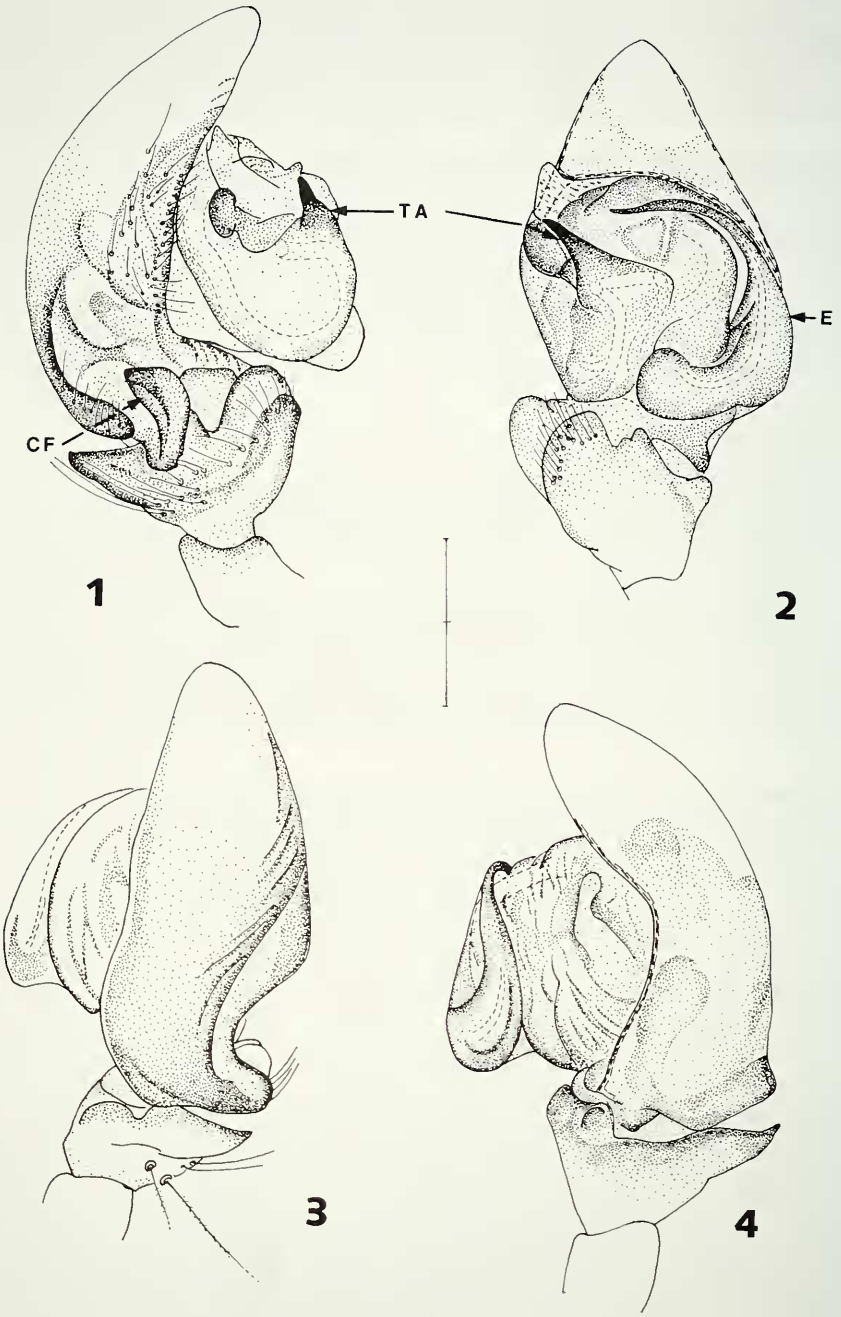
Female. Colouration and markings: Similar to male but lighter. Different by possessing dorsal opisthosomal markings as in Fig. 13; venter white. Palp with conical tarsus, longer than tibia (Fig. 19). Morphology further as in male.

Epigynum and vulva (Figs 5-7): Simple brown plate in anterior part; internal structure visible through thin tegument; copulatory openings in front hidden by plate; short copulatory ducts lead to thick-walled spermathecae, triangular in dorsal view.

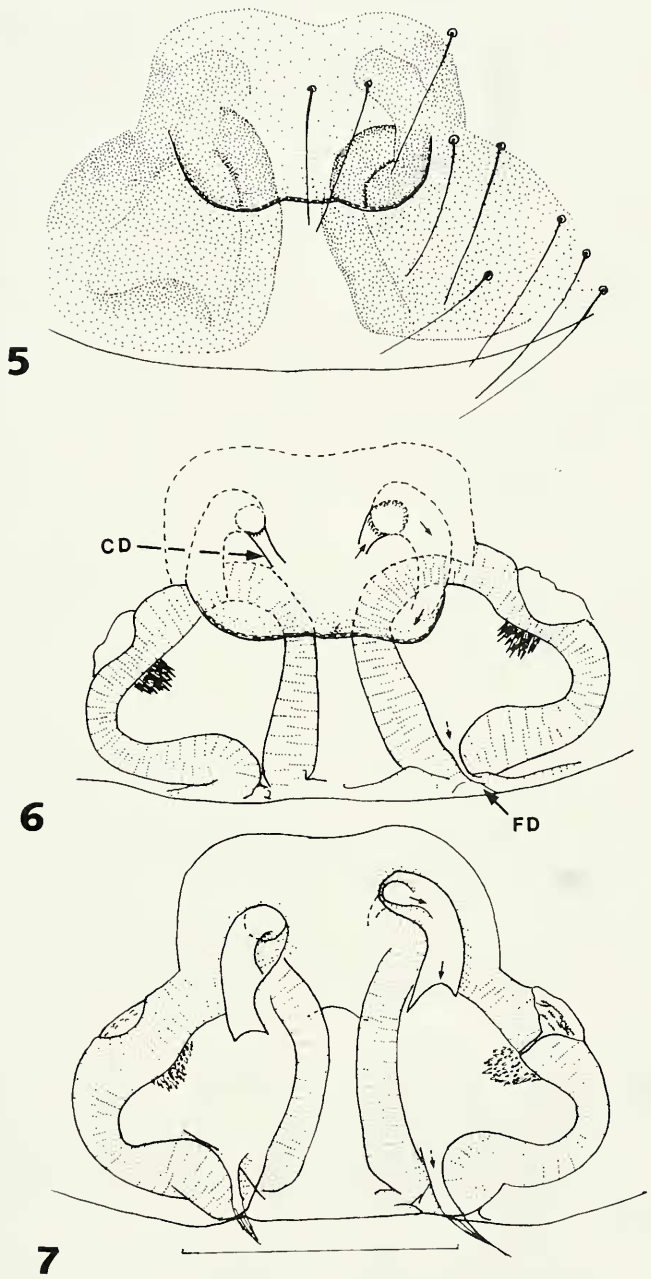
Measurements: Total length: 3.0; carapace length: 1.3; carapace width: 1.0. Legs:

	I	II	III	IV
femur	0.8	0.8	0.9	1.1
patella	0.3	0.3	0.4	0.4
tibia	0.8	0.7	0.6	0.8
metatarsus	0.9	0.7	0.8	1.2
tarsus	0.5	0.4	0.4	0.5
total	3.3	2.9	3.1	4.0

Affinities: *Suffasia* is defined by the presence of a chilum and promarginal cheliceral teeth, dark reticulation ("network pattern" *sensu* Jocqué, 1992), female palp with a long conical tarsus, femoral organ with simple setae on all legs, legs with flattened incised hairs and metatarsal preening brush consisting of chisel-shaped hairs (Jocqué, 1991, 1992). The present species clearly agrees with these characters and can thus be attributed to *Suffasia*. Yet the shape of the male palpal cymbium casts some doubt on this attribution. Although one of the main characteristics of *Asceua* Thorell, 1887 is exactly the strongly narrowed cymbium, there are a number of characters that exclude the incorporation of the present species in it: representatives of that genus do indeed



FIGS 1-4. *Suffasia mahasumana* sp. n. 1. Male palp, retrolateral view. 2. Ditto, ventral view. 3. Ditto, dorsal view. 4. Ditto, prolateral view. CF cymbial flange; E embolus; TA tegular apophysis. Scale line: 0.2 mm.



FIGS 5-7. *Suffasia mahasumana* sp. n. 5. Female epigynum, ventral view. 6. Vulva, ventral view. 7. Ditto, dorsal view. CD copulatory duct; FD fertilisation duct. Scale line: 0.1 mm.

lack teeth, have a uniform dark carapace and lack femoral organs. Yet, both *S. mahasumana* and *S. tumegaster* possess an epigynum that is quite different from what has been described for *Suffasia*. It might prove necessary to erect a new genus for these species if the male of type species of *Suffasia* appears equally different which was already recognised by Jocqué (1992).

Distribution: Known only from the type locality.

Suffasia attidiya sp. n. Figs 8-12

Holotype ♀: Sri Lanka, Western Province, Colombo, Bellanwila-Attidiya (approximately 6°50'N, 79°54'E), mean elevation 0.6 m asl, 22 February 1998, (MHNG).

Paratype ♀: Sri Lanka, Western Province, Kalugala, Labugama Forest Reserve, 3 August 1996, ca. 10 m (NMB). All specimens leg. Suresh P. Benjamin.

Etymology: Named after the type locality. Noun in apposition.

Diagnosis: The epigyne of *S. attidiya* differs from that of *S. tigrina* by the course of the copulatory ducts which run directly inwards in the latter, outwards thence inwards in the new species. *S. mahasumana* is clearly different by the presence of a plate in the epigyne.

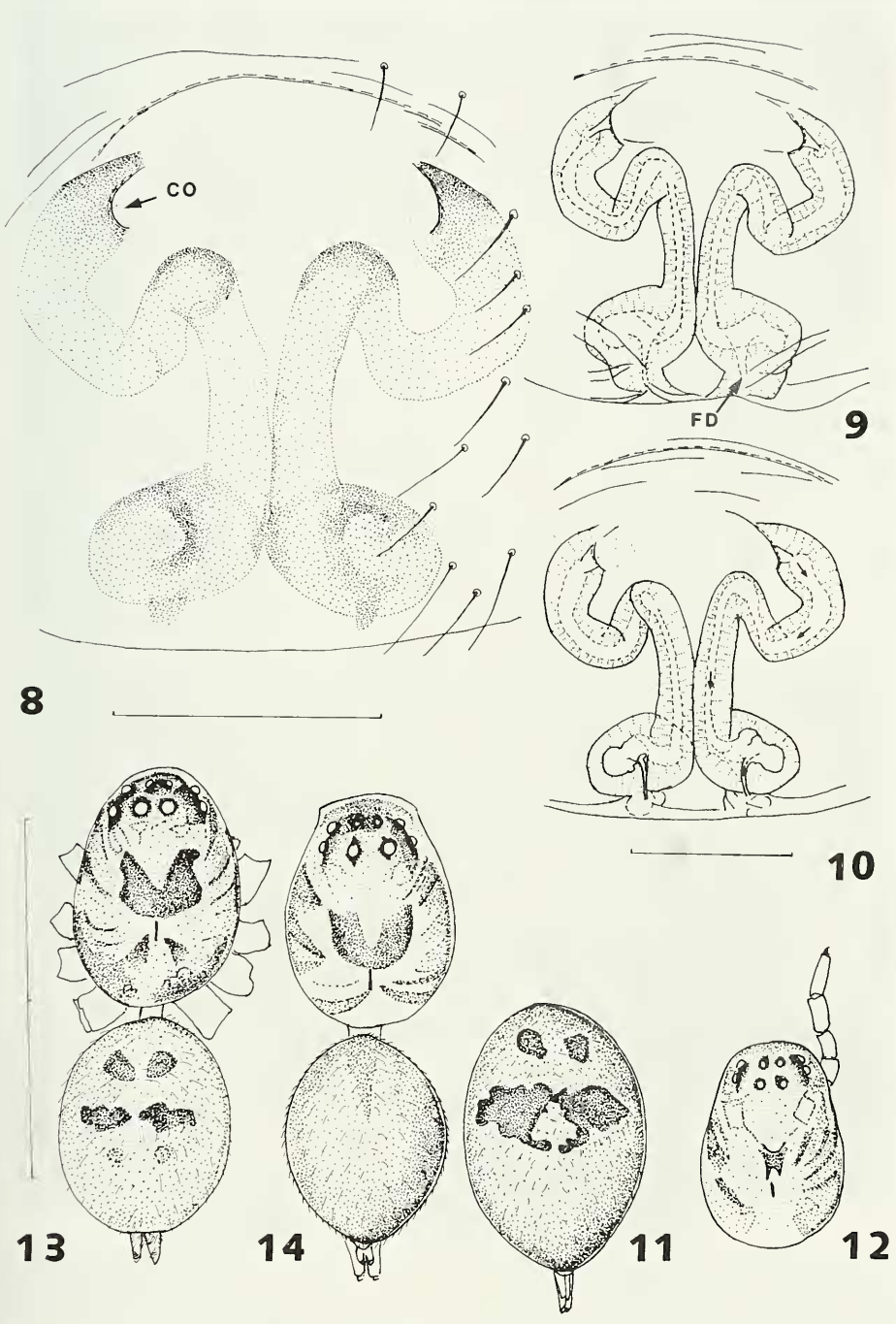
Description: Female (holotype). Colouration and markings: prosoma dorsally dark yellow-brown, with dark markings in front of fovea (Fig. 12). Chelicerae and sternum dark yellow lighter than dorsal prosoma. Dorsum of opisthosoma with markings as in Fig. 11, venter white. Legs light yellow with dark dorsal markings. AER slightly procurved, PER procurved, all eyes circular, AME 1.5 times their diameter apart from each other, 0.5 times from ALE. PME 2 times their diameter apart and 2.5 times from PLE. ALE = PLE = PME > AME. Clypeus height 6 times the diameter of ALE. Chilum present; chelicerae not fused, with double tooth on promargin. Labium triangular. Sternum sub triangular, with spike-like extensions projecting towards base of coxae. Palp with conical tarsus, longer than tibia. Flattened incised hairs on tibiae; ventral tuft of metatarsal preening brush with chisel-shaped hairs.

Epigynum and vulva (Figs 8-10): Epigynum simple, anterior sclerotized border with CO situated laterally. Thick-walled copulatory ducts straight and close to each other in posterior part, leading to small globular rectptacula, with thick walls. FD as in Fig. 9.

Male. Unknown.

Affinities: As zodariid genera are mainly diagnosed on male palpal morphology (Jocqué, 1991, 1992) the placement of this new species of *Suffasia* might appear ambiguous. However, the similarities of the epigynum of the present species and of the type species are so striking that there is little doubt that they are congeneric. In both cases the internal structure is simple with lateral CO, strongly sclerotized CD with a partly parallel course and roughly oval spermathecae.

FIGS 8-14. *Suffasia attidiya* sp. n. (8-12). *Suffasia mahasumana* sp. n. (13, 14). 8. Female epigynum, ventral view. 9. Vulva, ventral view. 10. Ditto, dorsal view. 11. Female opisthosoma, dorsal view. 12. Female prosoma and right palp, dorsal view. 13. Female, dorsal view. 14. Male, dorsal view. CO copulatory opening; FD fertilisation duct. Scale lines: 0.1 mm (8-10), 2.0 mm (11-14).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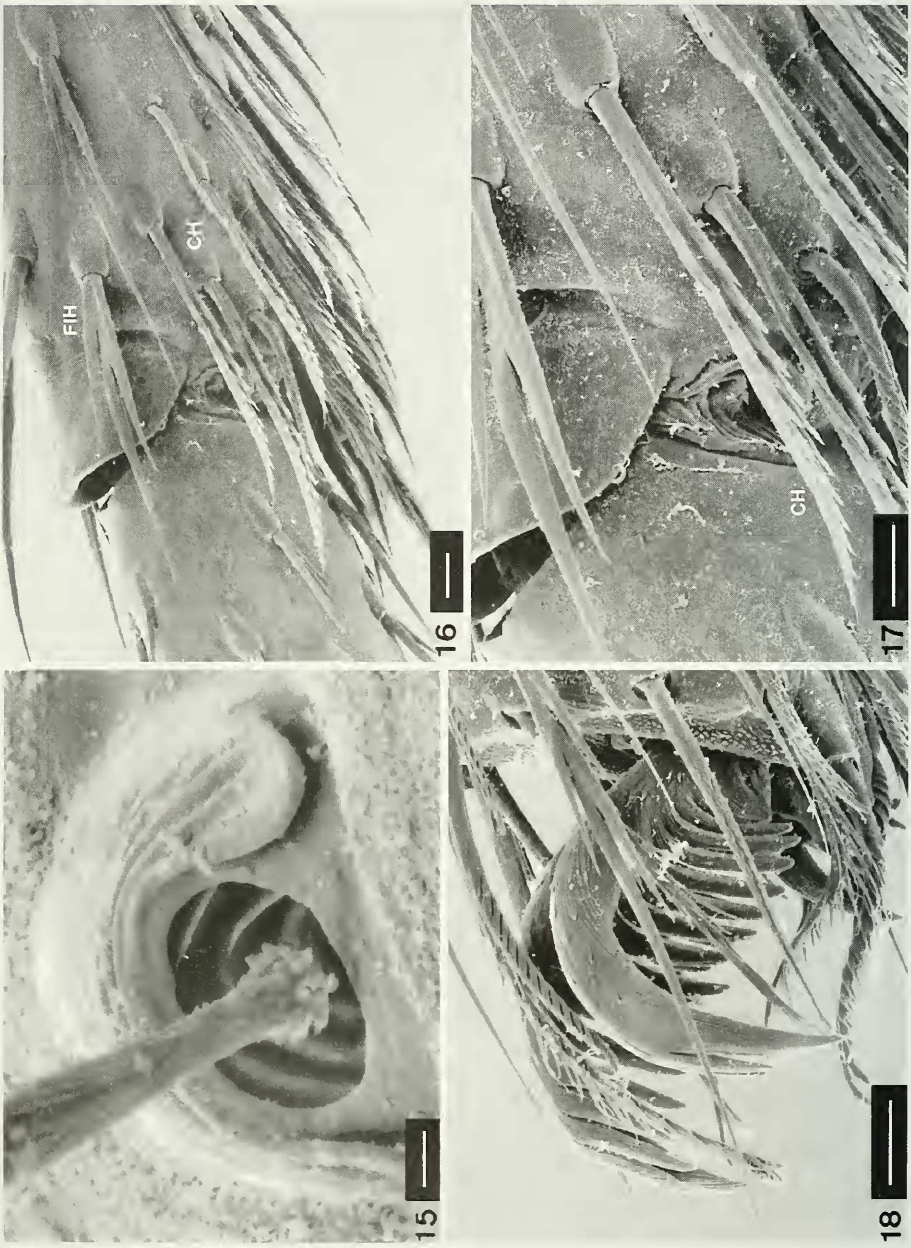
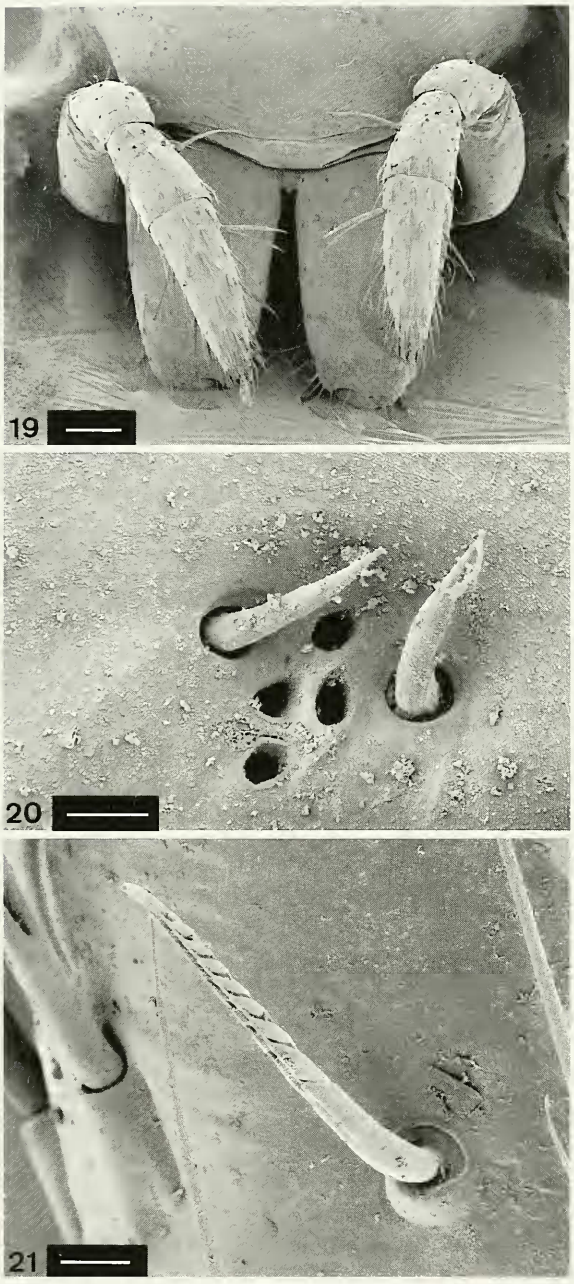


FIGS 15-18. *Suffasia mahasumana* sp. n., SEM micrographs. 15. Base of trichobothrium. 16. Preening brush on distal metatarsus of leg I, lateral view. 17. Ditto, detail. 18. Tip of leg I, lateral view. CH chisel-shaped hairs, FIS flattened incised hairs. Scale lines: 0.001 mm (1), 0.01 mm (16-18).



FIGS 19-21. *Suffasia mahasumana* sp. n., SEM micrographs. 19. Chelicerae and palps of female, frontal view. 20. Femoral organ, on leg I. 21. Chemosensitive hair on metatarsus. Scale lines: 0.003 mm (20), 005 mm (21), 0.1 mm (19).

Measurements: Total length: 2.6; carapace length: 1.3; carapace width: 1.0. Legs:

	I	II	III	IV
femur	0.6	0.5	0.6	0.7
patella	0.1	0.1	0.2	0.2
tibia	0.5	0.4	0.4	0.6
metatarsus	0.6	0.5	0.5	0.8
tarsus	0.4	0.3	0.3	0.4
total	2.2	1.8	2.0	2.7

Distribution: Known from Bellanwila-Attidiya sanctuary and Kalugala, Labugama Forest Reserve.

DISCUSSION

The placement of the two new species in the genus *Suffasia* is in accordance with the current definition of the genus. However the relationships proposed here should be re-analysed when additional material, most importantly the male of *S. tigriua* is discovered.

In his revision of the Zodariidae Jocqué (1991) considered the subfamilies Zodariinae and Storeninae to be monophyletic. This hypothesis was based on presumed autapomorphies such as the presence of a femoral organ and flattened incised hairs for the Zodariinae and chisel-shaped hairs on the metatarsal preening brush for Storeninae. The discovery of *S. tunegaster*, which possesses a combination of all these characters, led to an amalgamation of these two subfamilies (Jocqué, 1992). *S. uahasuuana* sp. n. which also possesses these three characters, further confirms his combination of both subfamilies.

The discovery of the new taxa extends the previously known distribution (Nepal, India) of the genus *Suffasia* southwards to Sri Lanka.

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